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**1**  **A reconfigurable multi-function computing cache architecture**          ■

Hue-Sung Kim, Arun K. Somani, Akhilesh Tyagi
February 2000 **Proceedings of the 2000 ACM/SIGDA eighth international symposium on Field programmable gate arrays**
**Publisher:** ACM Press

Full text available: 📄 pdf(992.08 KB)          Additional Information: full citation, abstract, references, citings, index terms

> A considerable portion of a chip is dedicated to a cache memory in a modern microprocessor chip. However, some applications may not actively need all the cache storage, especially the computing bandwidth limited applications. Instead, such applications may be able to use some additional computing resources. If the unused portion of the cache could serve these computation needs, the on-chip resources would be utilized more efficiently. This presents an opportunity to explore the reconfigurat ...

**2**  **Smart Memories: a modular reconfigurable architecture**          ■

Ken Mai, Tim Paaske, Nuwan Jayasena, Ron Ho, William J. Dally, Mark Horowitz
May 2000 **ACM SIGARCH Computer Architecture News , Proceedings of the 27th annual international symposium on Computer architecture ISCA '00**, Volume 28 Issue 2
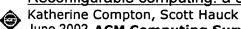**Publisher:** ACM Press

Full text available: 📄 pdf(80.16 KB)          Additional Information: full citation, abstract, references, citings, index terms

> Trends in VLSI technology scaling demand that future computing devices be narrowly focused to achieve high performance and high efficiency, yet also target the high volumes and low costs of widely applicable general purpose designs. To address these conflicting requirements, we propose a modular reconfigurable architecture called Smart Memories, targeted at computing needs in the 0.1&mgr; technology generation. A Smart Memories chip is made up of many processing tiles, each containing local ...

**3**  **Reconfigurable computing: a survey of systems and software**          ■

Katherine Compton, Scott Hauck
June 2002 **ACM Computing Surveys (CSUR)**, Volume 34 Issue 2
**Publisher:** ACM Press

Full text available: 📄 pdf(710.56 KB)          Additional Information: full citation, abstract, references, citings, index terms, review

> Due to its potential to greatly accelerate a wide variety of applications, reconfigurable computing has become a subject of a great deal of research. Its key feature is the ability to perform computations in hardware to increase performance, while retaining much of the flexibility of a software solution. In this survey, we explore the hardware aspects of

reconfigurable computing machines, from single chip architectures to multi-chip systems, including internal structures and external coupling. W ...

**Keywords**: Automatic design, FPGA, field-programmable, manual design, reconfigurable architectures, reconfigurable computing, reconfigurable systems

4   An adaptive cryptographic engine for internet protocol security architectures

Andreas Dandalis, Viktor K. Prasanna

July 2004  **ACM Transactions on Design Automation of Electronic Systems (TODAES)**, Volume 9 Issue 3

**Publisher**: ACM Press

Full text available: pdf(264.87 KB)   Additional Information: full citation, abstract, references, index terms

Architectures that implement the Internet Protocol Security (IPSec) standard have to meet the enormous computing demands of cryptographic algorithms. In addition, IPSec architectures have to be flexible enough to adapt to diverse security parameters. This article proposes an FPGA-based Adaptive Cryptographic Engine (ACE) for IPSec architectures. By taking advantage of FPGA technology, ACE can adapt to diverse security parameters on the fly while providing superior performance compared with softw ...

**Keywords**: AES, Adaptive computing, IPSec, configurable, cryptography, high performance, performance tradeoffs, reconfigurable components, reconfigurable computing, reconfigurable systems

5   A highly configurable cache architecture for embedded systems

Chuanjun Zhang, Frank Vahid, Walid Najjar

May 2003  **ACM SIGARCH Computer Architecture News , Proceedings of the 30th annual international symposium on Computer architecture ISCA '03**, Volume 31 Issue 2

**Publisher**: ACM Press

Full text available: pdf(302.87 KB)   Additional Information: full citation, abstract, references, citings

Energy consumption is a major concern in many embedded computing systems. Several studies have shown that cache memories account for about 50% of the total energy consumed in these systems. The performance of a given cache architecture is largely determined by the behavior of the application using that cache. Desktop systems have to accommodate a very wide range of applications and therefore the manufacturer usually sets the cache architecture as a compromise given current applications, technolo ...

**Keywords**: architecture tuning, cache, configurable, embedded systems, low energy, low power, microprocessor

6   Run-time performance optimization of an FPGA-based deduction engine for SAT solvers

Andreas Dandalis, Viktor K. Prasanna

October 2002 **ACM Transactions on Design Automation of Electronic Systems (TODAES)**, Volume 7 Issue 4

**Publisher**: ACM Press

Full text available: pdf(375.20 KB)   Additional Information: full citation, abstract, references, citings, index terms

FPGAs are a promising technology for accelerating SAT solvers. Besides their high density, fine granularity, and massive parallelism, FPGAs provide the opportunity for run-time customization of the hardware based on the given SAT instance. In this article, a parallel deduction engine is proposed for backtrack search algorithms. The performance of the deduction engine is critical to the overall performance of the algorithm because, for any moderate SAT instance, millions of implications are deriv ...

**Keywords**: Adaptive computing, Boolean satisfiability, configurable, high performance, performance trade-offs, reconfigurable components, reconfigurable computing, reconfigurable systems

**7**  A highly configurable cache for low energy embedded systems

Chuanjun Zhang, Frank Vahid, Walid Najjar

May 2005 **ACM Transactions on Embedded Computing Systems (TECS)**, Volume 4 Issue 2

**Publisher:** ACM Press

Full text available: pdf(714.89 KB)     Additional Information: full citation, abstract, references, index terms

Energy consumption is a major concern in many embedded computing systems. Several studies have shown that cache memories account for about 50&percnt; of the total energy consumed in these systems. The performance of a given cache architecture is determined, to a large degree, by the behavior of the application executing on the architecture. Desktop systems have to accommodate a very wide range of applications and therefore the cache architecture is usually set by the manufacturer as a best compr ...

**Keywords**: Cache, architecture tuning, configurable, embedded systems, low energy, low power, memory hierarchy, microprocessor

**8**  Representation of function variants for embedded system optimization and synthesis

K. Richter, D. Ziegenbein, R. Ernst, L. Thiele, J. Teich

June 1999 **Proceedings of the 36th ACM/IEEE conference on Design automation**

**Publisher:** ACM Press

Full text available: pdf(153.80 KB)     Additional Information: full citation, references, citings, index terms

**9**  Pipeline Architecture

C. V. Ramamoorthy, H. F. Li

March 1977 **ACM Computing Surveys (CSUR)**, Volume 9 Issue 1

**Publisher:** ACM Press

Full text available: pdf(3.53 MB)     Additional Information: full citation, references, citings, index terms

**10**  Special issue: AI in engineering

D. Sriram, R. Joobbani

April 1985 **ACM SIGART Bulletin**, Issue 92

**Publisher:** ACM Press

Full text available: pdf(8.79 MB)     Additional Information: full citation, abstract

The papers in this special issue were compiled from responses to the announcement in the July 1984 issue of the SIGART newsletter and notices posted over the ARPAnet. The interest being shown in this area is reflected in the sixty papers received from over six countries. About half the papers were received over the computer network.

**11**  Innovative synthesis methodologies and algorithms: Highly flexible multi-mode system synthesis

Vinu Vijay Kumar, John Lach

September 2005 **Proceedings of the 3rd IEEE/ACM/IFIP international conference on Hardware/software codesign and system synthesis CODES+ISSS '05**

**Publisher:** ACM Press

Full text available: pdf(204.54 KB)     Additional Information: full citation, abstract, references, index terms

Multi-mode systems have emerged as an area- and power-efficient approach to

implementing multiple time-wise mutually exclusive algorithms and applications in a single hardware space. These systems have limited flexibility and temporal separation between modes is achieved by changing only the dataflow between components. This paper presents a synthesis methodology for integrating flexible components and controllers into primarily fixed logic multi-mode systems thereby increasing their overall fle ...

**Keywords**: adaptable systems, multi-mode synthesis, reconfigurability

## 12  Technology in the home: Artful systems in the home

Alex S. Taylor, Laurel Swan

April 2005 **Proceedings of the SIGCHI conference on Human factors in computing systems**
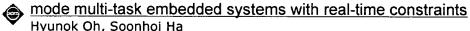
**Publisher:** ACM Press

Full text available: pdf(903.47 KB)   Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>index terms</u>

In this paper we introduce the idea of organizing systems. Through a number of examples from an ongoing ethnographic study of family life, we suggest that organizing systems come about through the artful design and use of informational artifacts in the home, such as calendars, paper notes, to-do lists, etc. These systems are not only seen to organize household routines and schedules, but also, crucially, to shape the social relations between family members. Drawing attention to the material prop ...

**Keywords**: domestic life, ethnography, home life, information devices, mothers' work, ubiquitous computing

## 13  System partitioning and timing analysis: Hardware-software cosynthesis of multi-mode multi-task embedded systems with real-time constraints

Hyunok Oh, Soonhoi Ha

May 2002 **Proceedings of the tenth international symposium on Hardware/software codesign**

**Publisher:** ACM Press

Full text available: pdf(452.60 KB)   Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>citings</u>, <u>index terms</u>

An embedded system is called multi-mode when it supports multiple applications by dynamically reconfiguring the system functionality. This paper proposes a hardware-software cosynthesis technique for multi-mode multi-task embedded systems with real-time constraints. The cosynthesis problem involves three subproblems: selection of appropriate processing elements, mapping and scheduling of function modules to the selected processing elements, and schedule analysis. The proposed cosynthesis framewo ...

**Keywords**: hardware-software cosynthesis, multi-mode, multi-task

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